PATENT & TRADEMARK OFFICE
MAY 28 2004
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FIG. 1

WIRELESS DATA SERVICES INFRASTRUCTURE

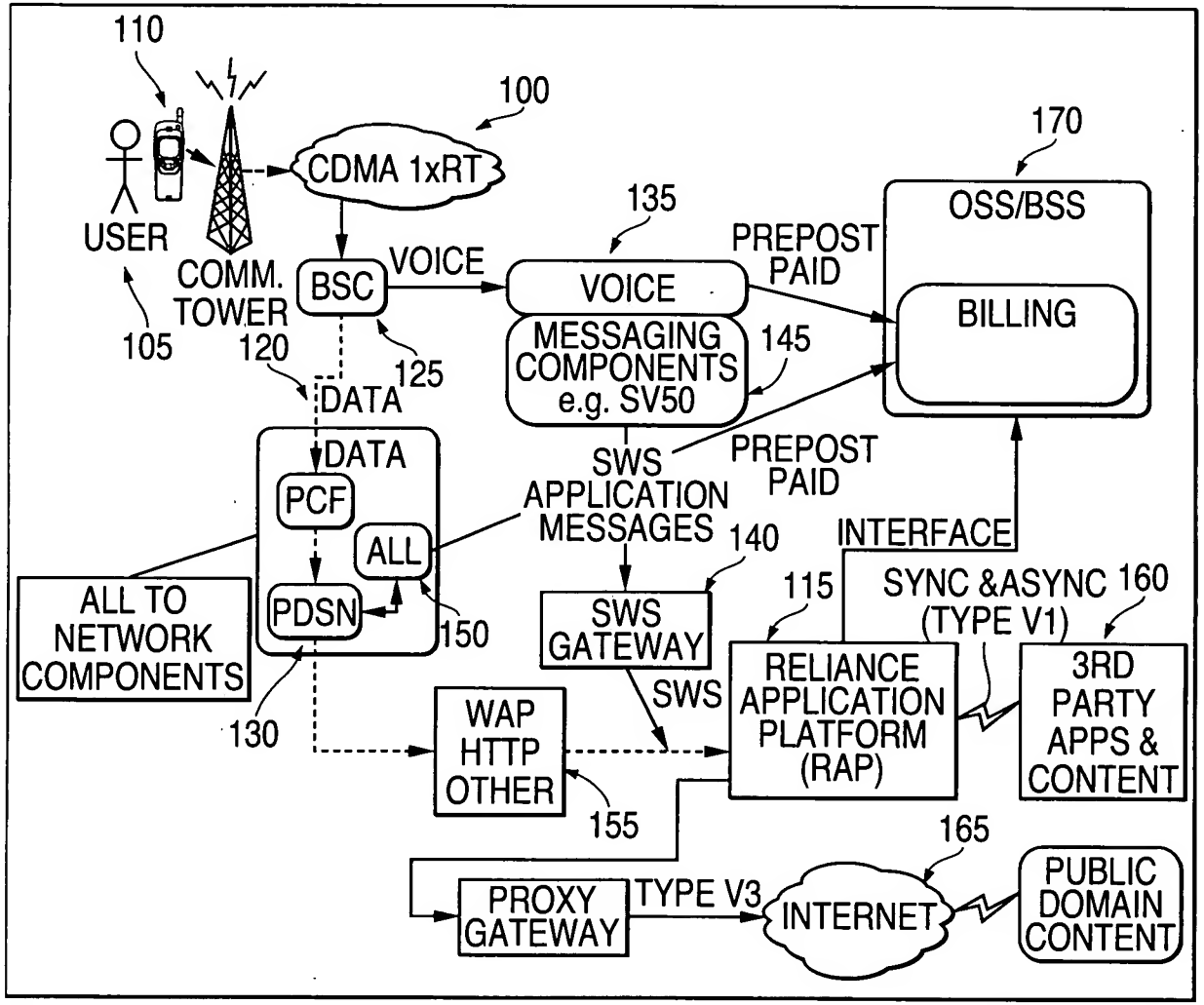


FIG. 2

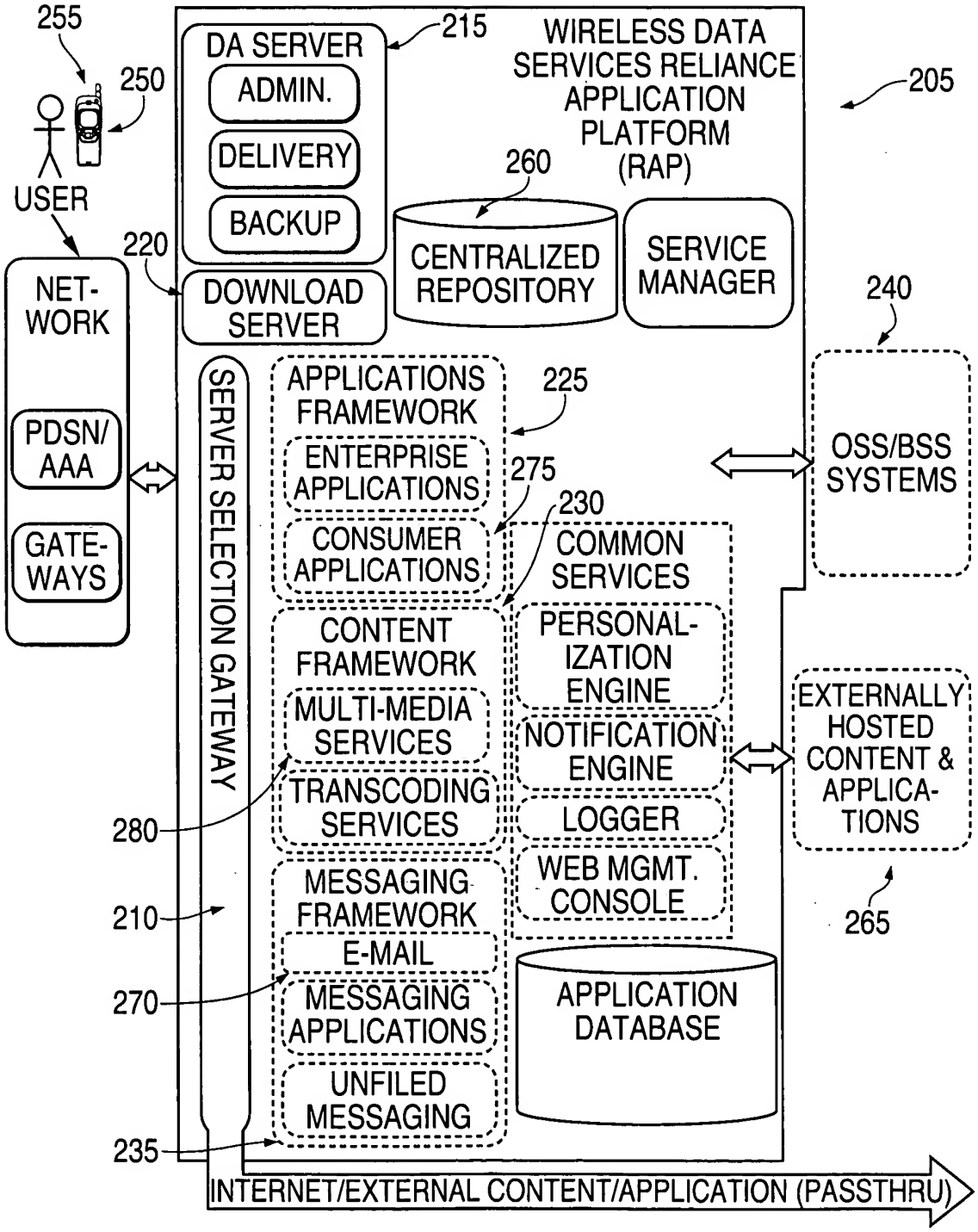

255
250
USER
DA SERVER
215
ADMIN.
DELIVERY
BACKUP
WIRELESS DATA SERVICES RELIANCE APPLICATION PLATFORM (RAP)
205
260
CENTRALIZED REPOSITORY
SERVICE MANAGER
220
DOWNLOAD SERVER
NET-WORK
PDSN/ AAA
GATE-WAYS
240
OSS/BSS SYSTEMS
SERVER SELECTION GATEWAY
APPLICATIONS FRAMEWORK
225
ENTERPRISE APPLICATIONS
275
CONSUMER APPLICATIONS
230
COMMON SERVICES
CONTENT FRAMEWORK
PERSONAL-IZATION ENGINE
MULTI-MEDIA SERVICES
NOTIFICATION ENGINE
EXTERNALLY HOSTED CONTENT & APPLICA-TIONS
TRANSCODING SERVICES
LOGGER
280
WEB MGMT. CONSOLE
MESSAGING FRAMEWORK
210
E-MAIL
265
APPLICATION DATABASE
270
MESSAGING APPLICATIONS
UNFILED MESSAGING
235
INTERNET/EXTERNAL CONTENT/APPLICATION (PASSTHRU)

FIG. 3

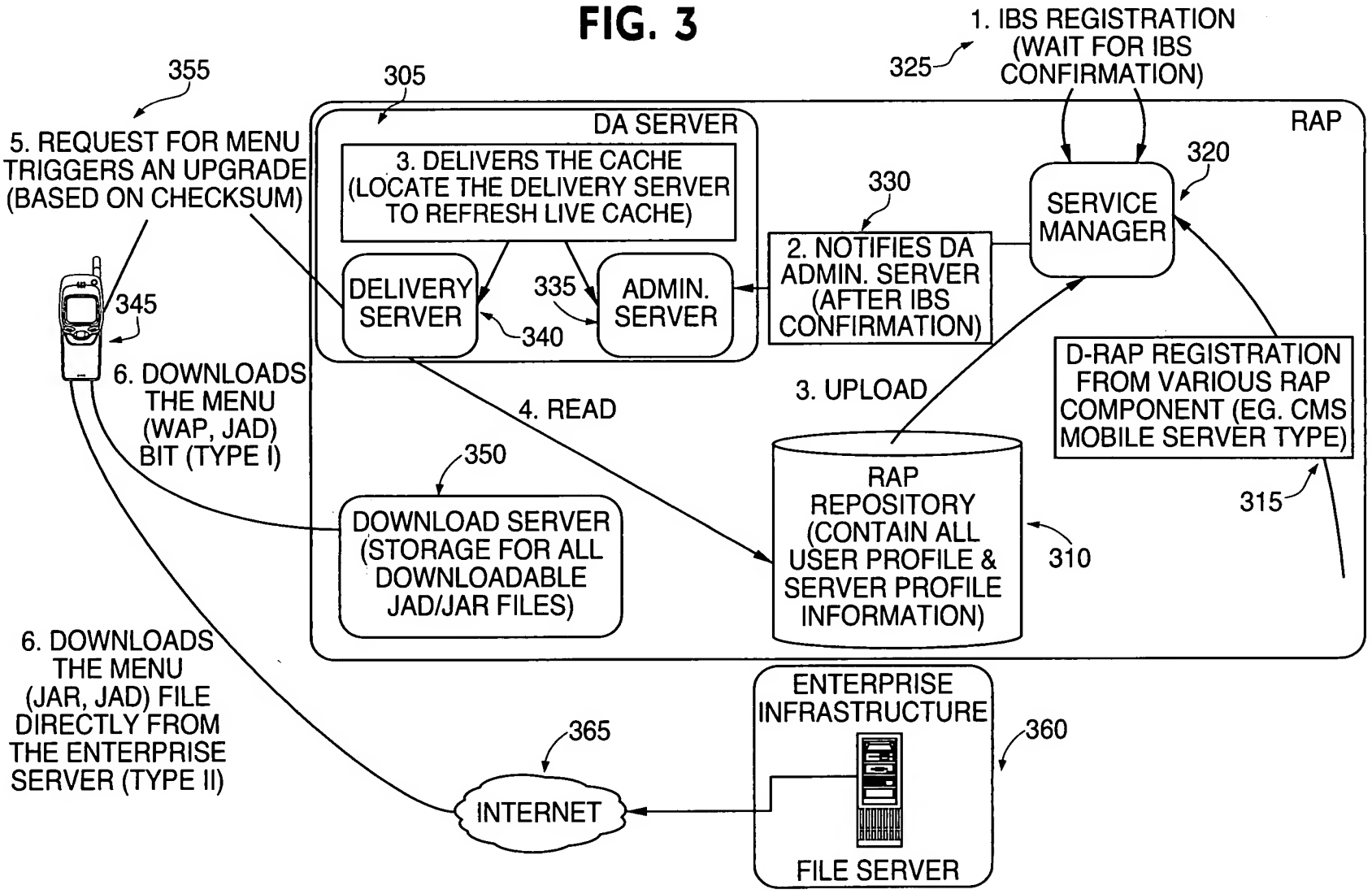

1. IBS REGISTRATION (WAIT FOR IBS CONFIRMATION)
325
355
305
RAP
DA SERVER
5. REQUEST FOR MENU TRIGGERS AN UPGRADE (BASED ON CHECKSUM)
3. DELIVERS THE CACHE (LOCATE THE DELIVERY SERVER TO REFRESH LIVE CACHE)
320
330
SERVICE MANAGER
2. NOTIFIES DA ADMIN. SERVER (AFTER IBS CONFIRMATION)
DELIVERY SERVER
335
ADMIN. SERVER
340
345
6. DOWNLOADS THE MENU (WAP, JAD) BIT (TYPE I)
4. READ
3. UPLOAD
D-RAP REGISTRATION FROM VARIOUS RAP COMPONENT (EG. CMS MOBILE SERVER TYPE)
350
RAP REPOSITORY (CONTAIN ALL USER PROFILE & SERVER PROFILE INFORMATION)
315
DOWNLOAD SERVER (STORAGE FOR ALL DOWNLOADABLE JAD/JAR FILES)
310
6. DOWNLOADS THE MENU (JAR, JAD) FILE DIRECTLY FROM THE ENTERPRISE SERVER (TYPE II)
ENTERPRISE INFRASTRUCTURE
365
360
INTERNET
FILE SERVER

FIG. 4

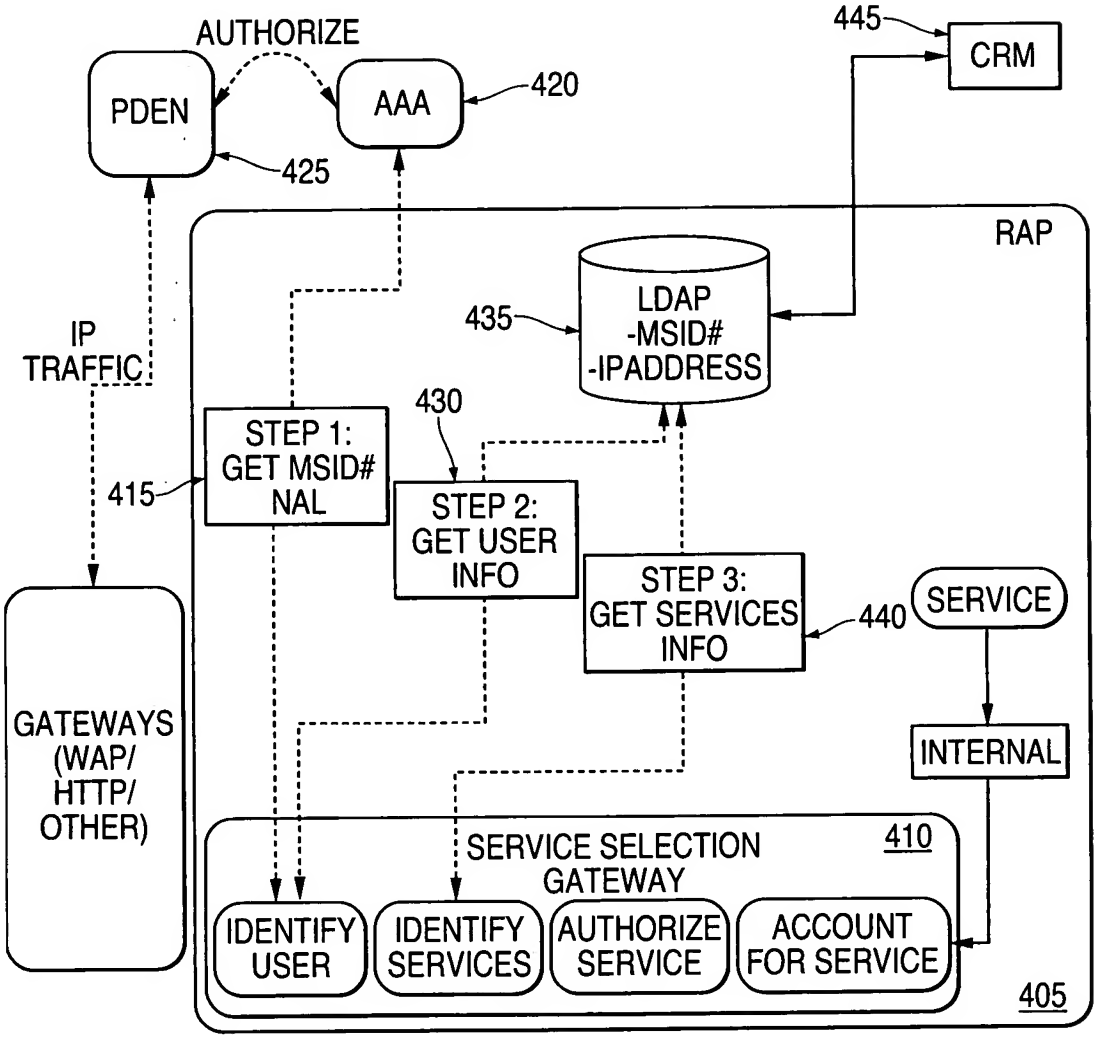

AUTHORIZE
PDEN
AAA
420
425
445
CRM
RAP
LDAP
-MSID#
-IPADDRESS
435
IP
TRAFFIC
430
STEP 1:
GET MSID#
NAL
415
STEP 2:
GET USER
INFO
STEP 3:
GET SERVICES
INFO
440
SERVICE
GATEWAYS
(WAP/
HTTP/
OTHER)
INTERNAL
SERVICE SELECTION
GATEWAY
410
IDENTIFY
USER
IDENTIFY
SERVICES
AUTHORIZE
SERVICE
ACCOUNT
FOR SERVICE
405

FIG. 5

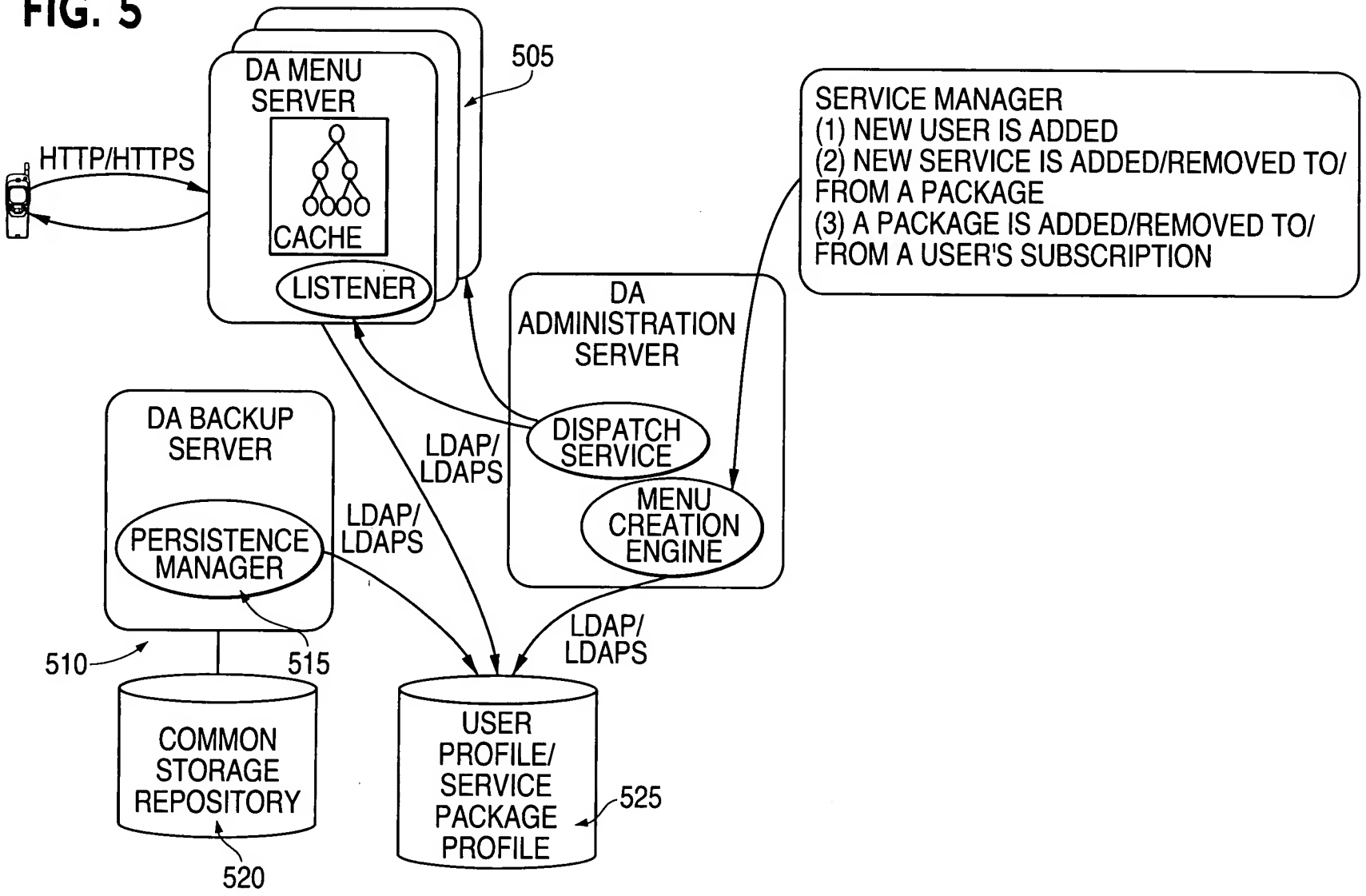

DA MENU SERVER
505
HTTP/HTTPS
CACHE
LISTENER
SERVICE MANAGER
(1) NEW USER IS ADDED
(2) NEW SERVICE IS ADDED/REMOVED TO/ FROM A PACKAGE
(3) A PACKAGE IS ADDED/REMOVED TO/ FROM A USER'S SUBSCRIPTION
DA ADMINISTRATION SERVER
DISPATCH SERVICE
MENU CREATION ENGINE
DA BACKUP SERVER
PERSISTENCE MANAGER
LDAP/ LDAPS
LDAP/ LDAPS
LDAP/ LDAPS
510
515
COMMON STORAGE REPOSITORY
520
USER PROFILE/ SERVICE PACKAGE PROFILE
525

FIG. 6

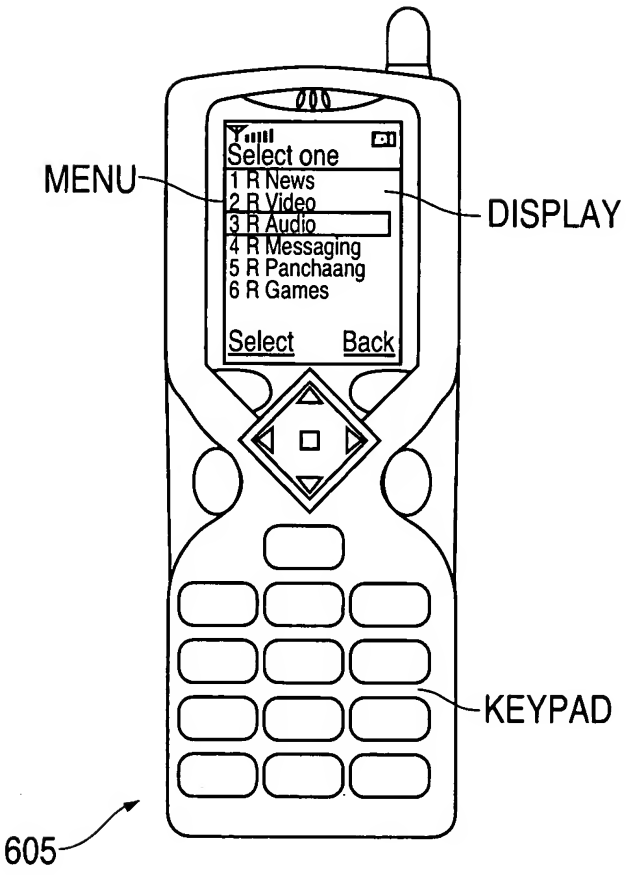
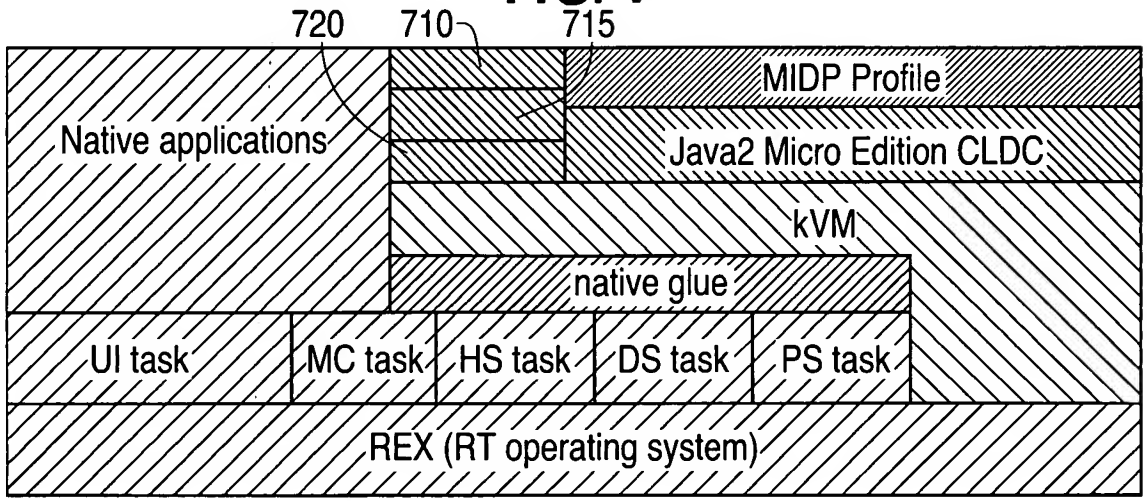

MENU
Select one
1 R News
2 R Video
3 R Audio
4 R Messaging
5 R Panchaang
6 R Games
Select
Back
DISPLAY
KEYPAD
605

FIG. 7



native application or software environment

native functions supporting VM including graphic primitives, socket environment, etc...

kVM written by native C langauge

Java™ API classes

MDP Profile

Java applications including network-based games, banking applications, etc...

FIG. 8

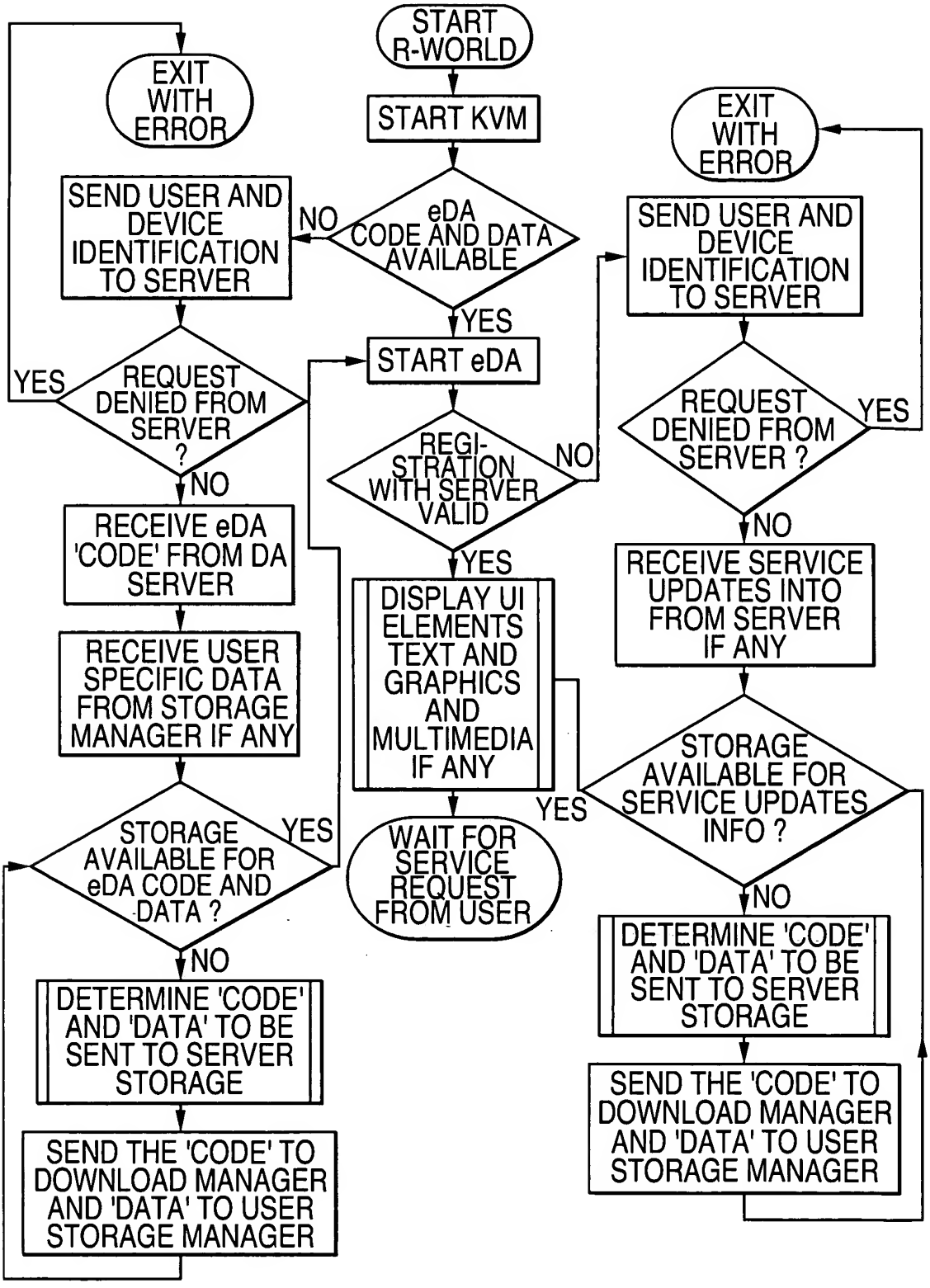

START R-WORLD
START KVM
eDA CODE AND DATA AVAILABLE
NO
YES
START eDA
REGI-STRATION WITH SERVER VALID
NO
YES
DISPLAY UI ELEMENTS TEXT AND GRAPHICS AND MULTIMEDIA IF ANY
WAIT FOR SERVICE REQUEST FROM USER
EXIT WITH ERROR
SEND USER AND DEVICE IDENTIFICATION TO SERVER
REQUEST DENIED FROM SERVER ?
YES
NO
RECEIVE eDA 'CODE' FROM DA SERVER
RECEIVE USER SPECIFIC DATA FROM STORAGE MANAGER IF ANY
STORAGE AVAILABLE FOR eDA CODE AND DATA ?
YES
NO
DETERMINE 'CODE' AND 'DATA' TO BE SENT TO SERVER STORAGE
SEND THE 'CODE' TO DOWNLOAD MANAGER AND 'DATA' TO USER STORAGE MANAGER
EXIT WITH ERROR
SEND USER AND DEVICE IDENTIFICATION TO SERVER
REQUEST DENIED FROM SERVER ?
YES
NO
RECEIVE SERVICE UPDATES INTO FROM SERVER IF ANY
STORAGE AVAILABLE FOR SERVICE UPDATES INFO ?
YES
NO
DETERMINE 'CODE' AND 'DATA' TO BE SENT TO SERVER STORAGE
SEND THE 'CODE' TO DOWNLOAD MANAGER AND 'DATA' TO USER STORAGE MANAGER

FIG. 9

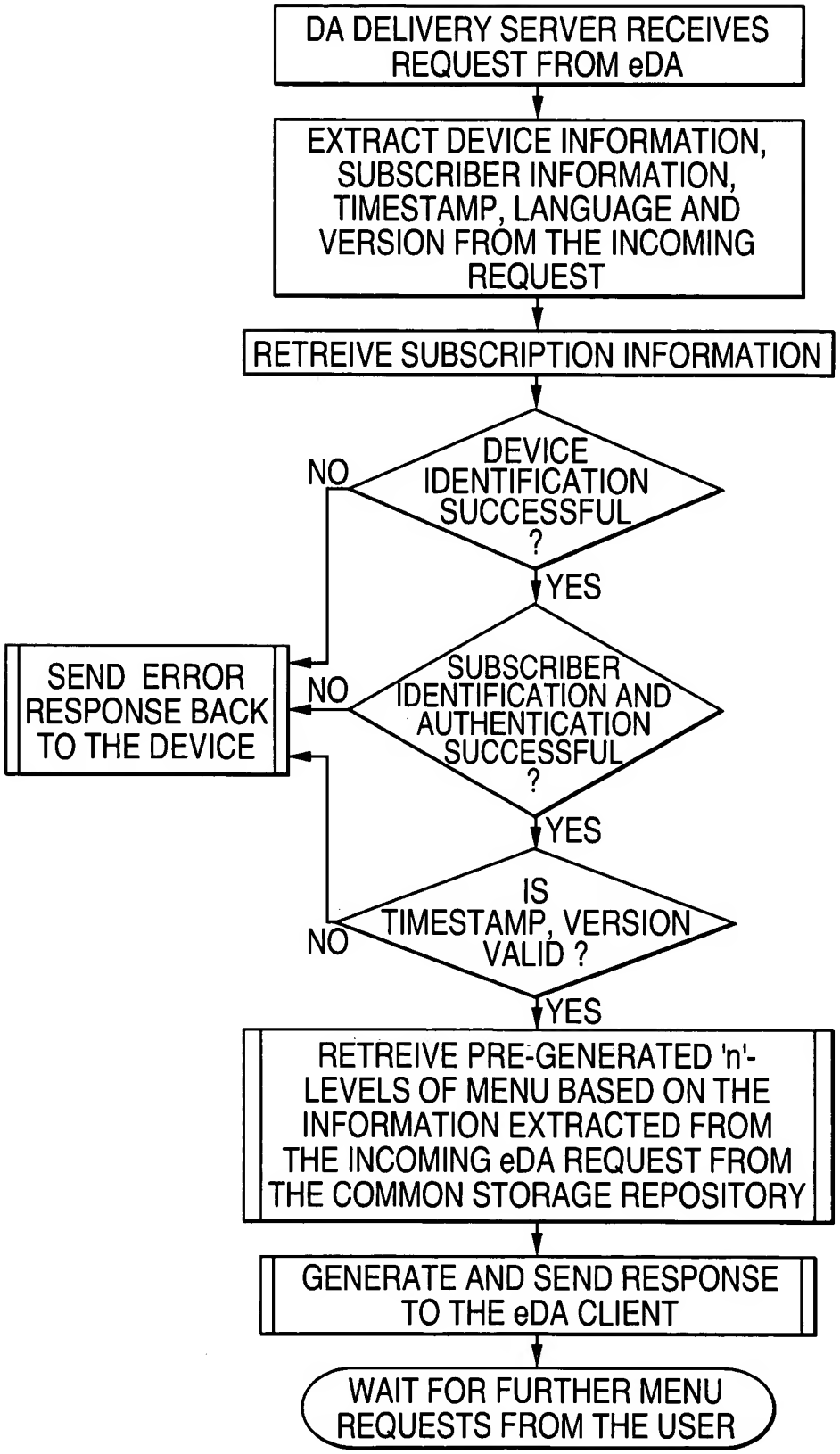

DA DELIVERY SERVER RECEIVES REQUEST FROM eDA
EXTRACT DEVICE INFORMATION, SUBSCRIBER INFORMATION, TIMESTAMP, LANGUAGE AND VERSION FROM THE INCOMING REQUEST
RETREIVE SUBSCRIPTION INFORMATION
DEVICE IDENTIFICATION SUCCESSFUL ?
NO
YES
SUBSCRIBER IDENTIFICATION AND AUTHENTICATION SUCCESSFUL ?
NO
YES
IS TIMESTAMP, VERSION VALID ?
NO
YES
SEND ERROR RESPONSE BACK TO THE DEVICE
RETREIVE PRE-GENERATED 'n'-LEVELS OF MENU BASED ON THE INFORMATION EXTRACTED FROM THE INCOMING eDA REQUEST FROM THE COMMON STORAGE REPOSITORY
GENERATE AND SEND RESPONSE TO THE eDA CLIENT
WAIT FOR FURTHER MENU REQUESTS FROM THE USER

FIG. 10

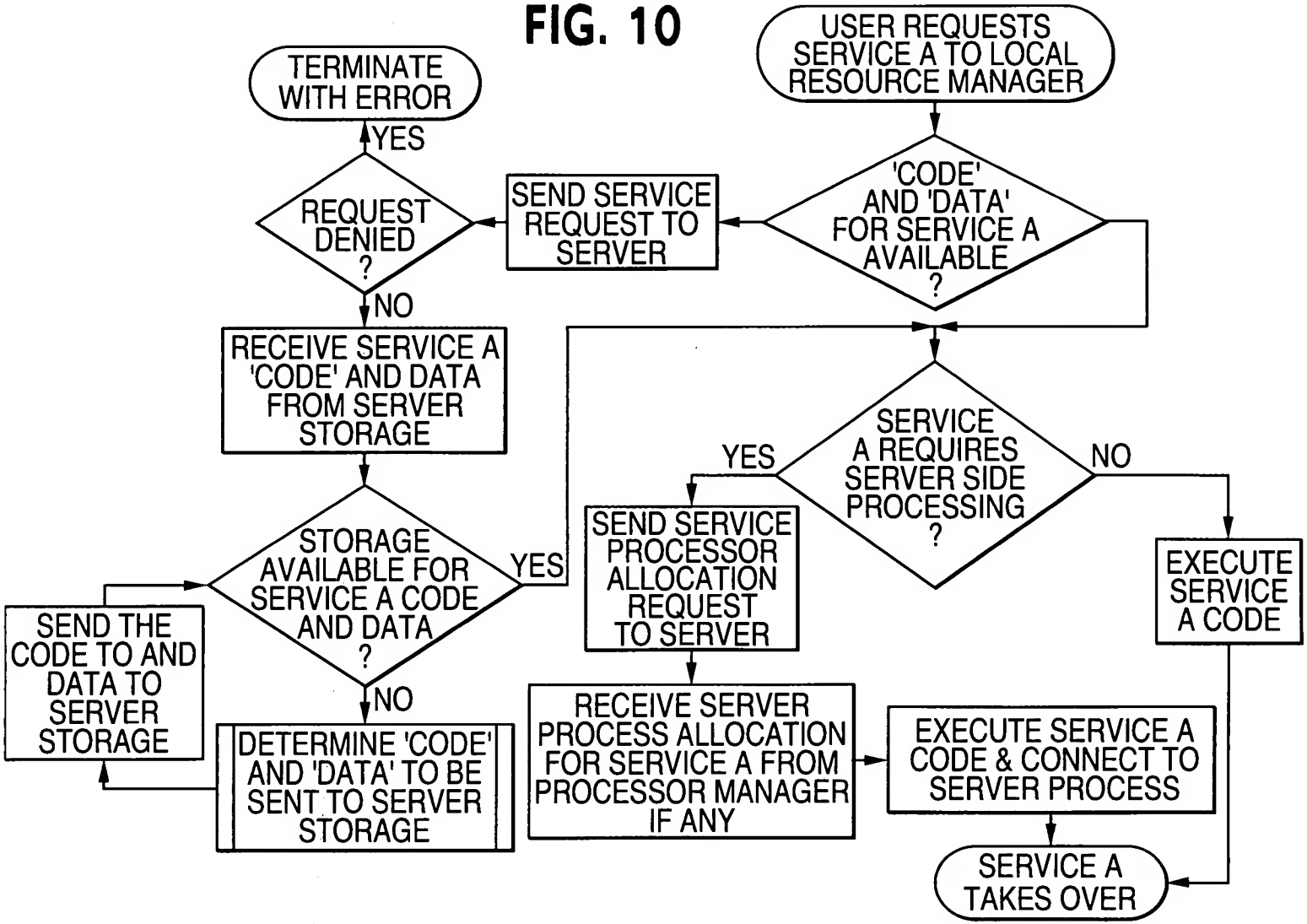

USER REQUESTS SERVICE A TO LOCAL RESOURCE MANAGER
'CODE' AND 'DATA' FOR SERVICE A AVAILABLE ?
SEND SERVICE REQUEST TO SERVER
REQUEST DENIED ?
YES
TERMINATE WITH ERROR
NO
RECEIVE SERVICE A 'CODE' AND DATA FROM SERVER STORAGE
SERVICE A REQUIRES SERVER SIDE PROCESSING ?
YES
NO
SEND SERVICE PROCESSOR ALLOCATION REQUEST TO SERVER
EXECUTE SERVICE A CODE
STORAGE AVAILABLE FOR SERVICE A CODE AND DATA ?
YES
NO
SEND THE CODE TO AND DATA TO SERVER STORAGE
DETERMINE 'CODE' AND 'DATA' TO BE SENT TO SERVER STORAGE
RECEIVE SERVER PROCESS ALLOCATION FOR SERVICE A FROM PROCESSOR MANAGER IF ANY
EXECUTE SERVICE A CODE & CONNECT TO SERVER PROCESS
SERVICE A TAKES OVER

FIG. 11

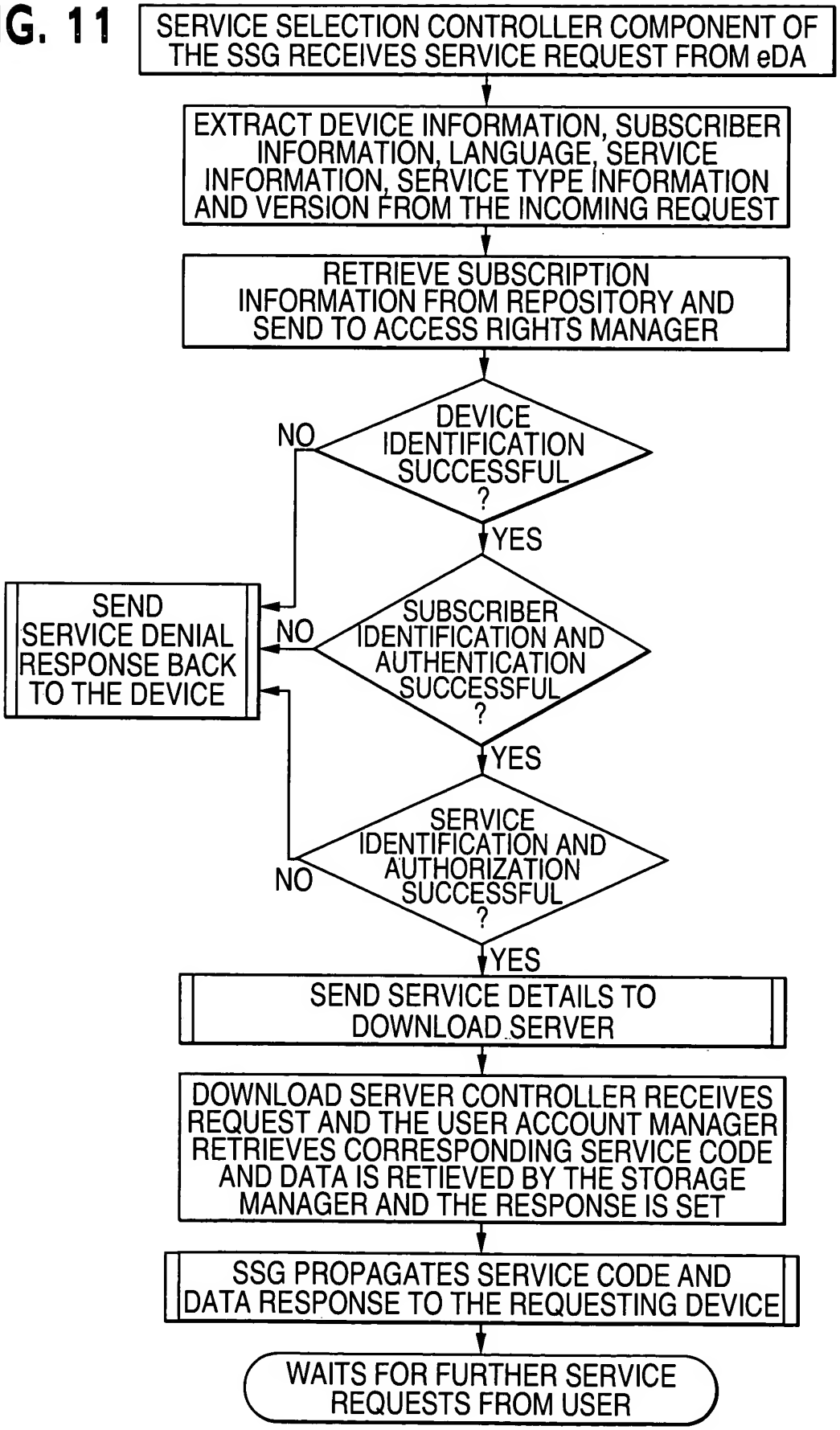

SERVICE SELECTION CONTROLLER COMPONENT OF THE SSG RECEIVES SERVICE REQUEST FROM eDA
EXTRACT DEVICE INFORMATION, SUBSCRIBER INFORMATION, LANGUAGE, SERVICE INFORMATION, SERVICE TYPE INFORMATION AND VERSION FROM THE INCOMING REQUEST
RETRIEVE SUBSCRIPTION INFORMATION FROM REPOSITORY AND SEND TO ACCESS RIGHTS MANAGER
DEVICE IDENTIFICATION SUCCESSFUL ?
NO
YES
SUBSCRIBER IDENTIFICATION AND AUTHENTICATION SUCCESSFUL ?
NO
YES
SERVICE IDENTIFICATION AND AUTHORIZATION SUCCESSFUL ?
NO
YES
SEND SERVICE DENIAL RESPONSE BACK TO THE DEVICE
SEND SERVICE DETAILS TO DOWNLOAD SERVER
DOWNLOAD SERVER CONTROLLER RECEIVES REQUEST AND THE USER ACCOUNT MANAGER RETRIEVES CORRESPONDING SERVICE CODE AND DATA IS RETIEVED BY THE STORAGE MANAGER AND THE RESPONSE IS SET
SSG PROPAGATES SERVICE CODE AND DATA RESPONSE TO THE REQUESTING DEVICE
WAITS FOR FURTHER SERVICE REQUESTS FROM USER

FIG. 12

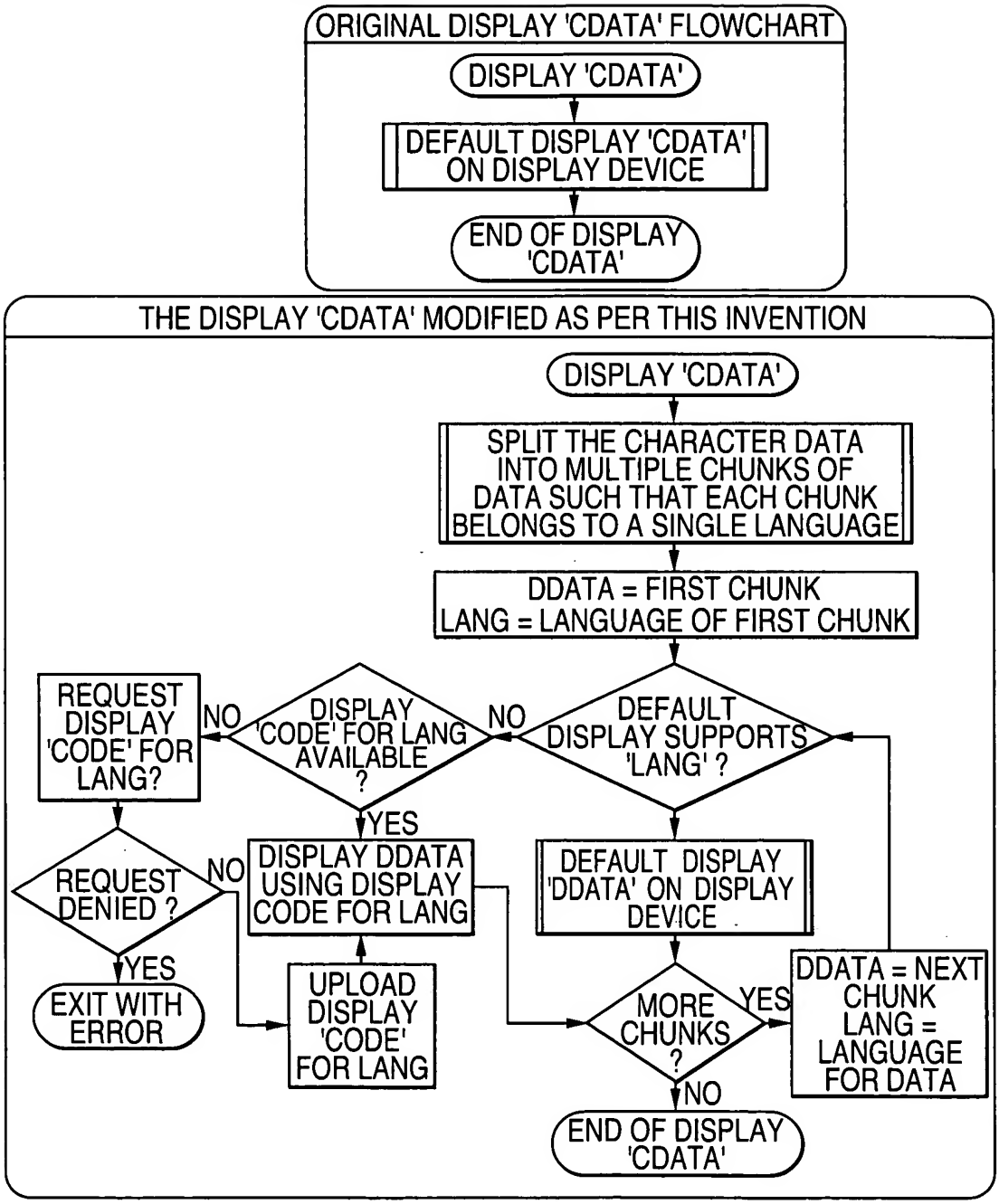

ORIGINAL DISPLAY 'CDATA' FLOWCHART
DISPLAY 'CDATA'
DEFAULT DISPLAY 'CDATA' ON DISPLAY DEVICE
END OF DISPLAY 'CDATA'
THE DISPLAY 'CDATA' MODIFIED AS PER THIS INVENTION
DISPLAY 'CDATA'
SPLIT THE CHARACTER DATA INTO MULTIPLE CHUNKS OF DATA SUCH THAT EACH CHUNK BELONGS TO A SINGLE LANGUAGE
DDATA = FIRST CHUNK
LANG = LANGUAGE OF FIRST CHUNK
DEFAULT DISPLAY SUPPORTS 'LANG' ?
NO
DISPLAY 'CODE' FOR LANG AVAILABLE ?
NO
REQUEST DISPLAY 'CODE' FOR LANG?
YES
REQUEST DENIED ?
NO
YES
EXIT WITH ERROR
DISPLAY DDATA USING DISPLAY CODE FOR LANG
UPLOAD DISPLAY 'CODE' FOR LANG
DEFAULT DISPLAY 'DDATA' ON DISPLAY DEVICE
MORE CHUNKS ?
YES
DDATA = NEXT CHUNK LANG = LANGUAGE FOR DATA
NO
END OF DISPLAY 'CDATA'

FIG. 13

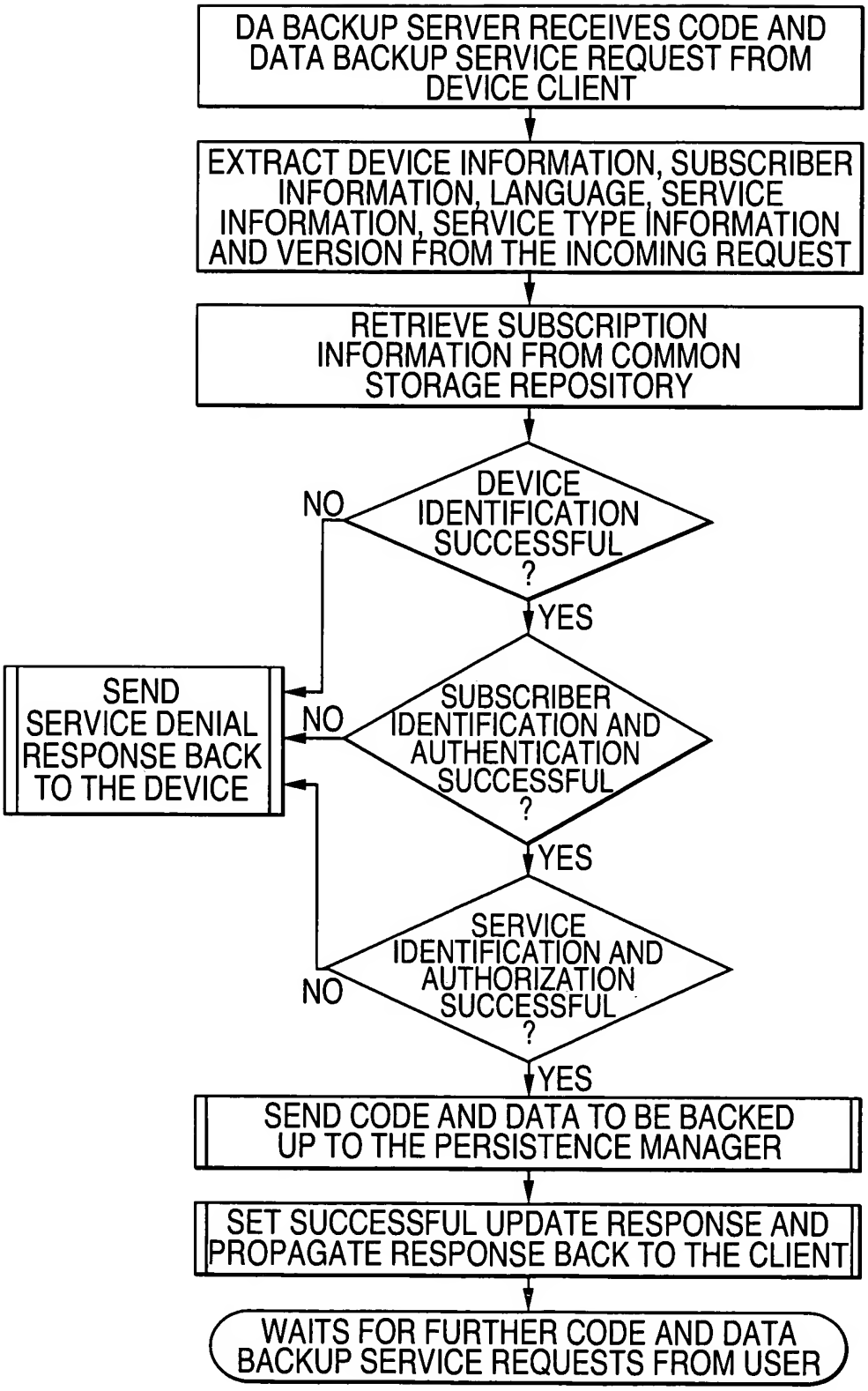
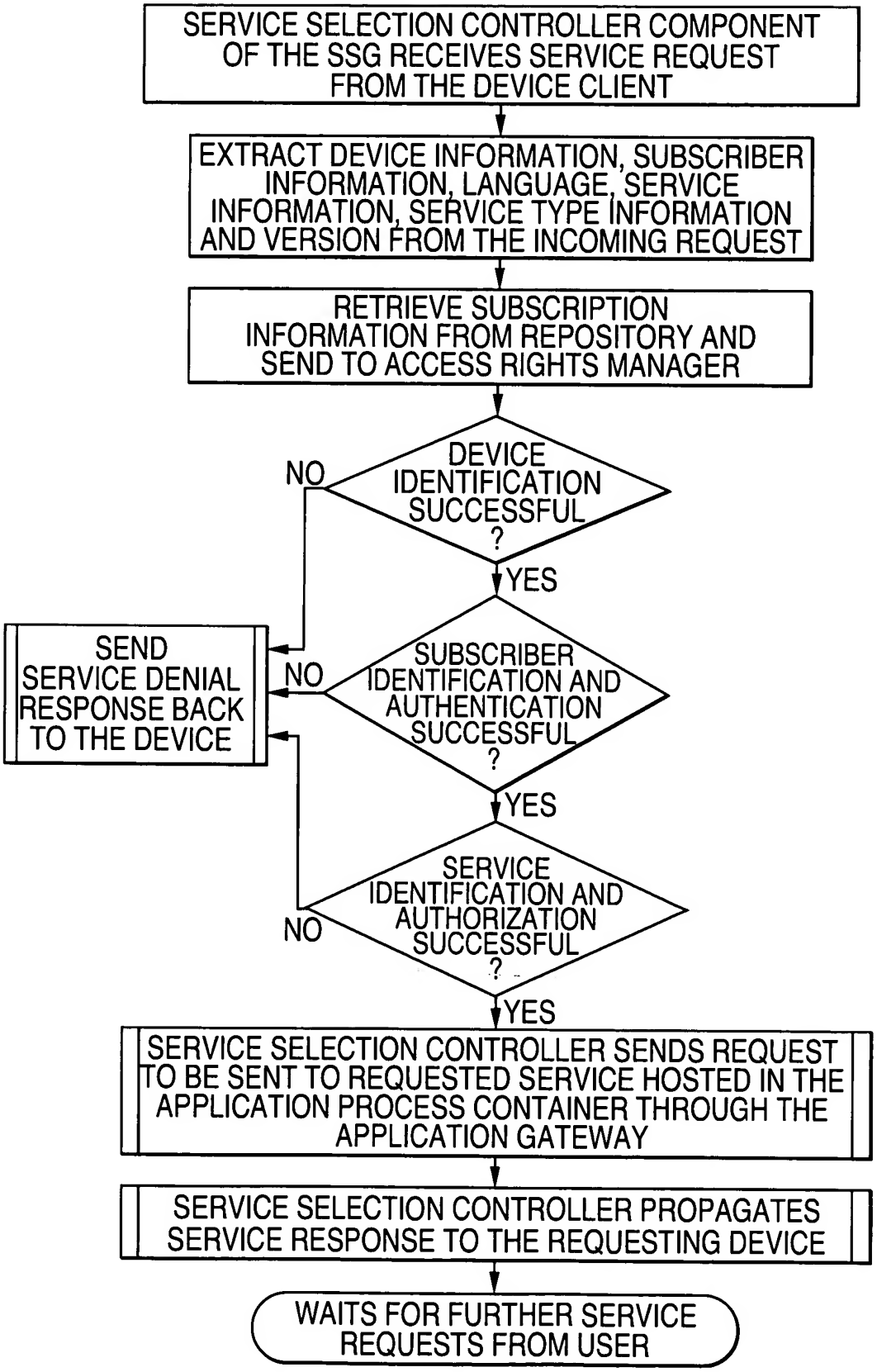

DA BACKUP SERVER RECEIVES CODE AND DATA BACKUP SERVICE REQUEST FROM DEVICE CLIENT
EXTRACT DEVICE INFORMATION, SUBSCRIBER INFORMATION, LANGUAGE, SERVICE INFORMATION, SERVICE TYPE INFORMATION AND VERSION FROM THE INCOMING REQUEST
RETRIEVE SUBSCRIPTION INFORMATION FROM COMMON STORAGE REPOSITORY
DEVICE IDENTIFICATION SUCCESSFUL ?
NO
YES
SUBSCRIBER IDENTIFICATION AND AUTHENTICATION SUCCESSFUL ?
NO
YES
SERVICE IDENTIFICATION AND AUTHORIZATION SUCCESSFUL ?
NO
YES
SEND SERVICE DENIAL RESPONSE BACK TO THE DEVICE
SEND CODE AND DATA TO BE BACKED UP TO THE PERSISTENCE MANAGER
SET SUCCESSFUL UPDATE RESPONSE AND PROPAGATE RESPONSE BACK TO THE CLIENT
WAITS FOR FURTHER CODE AND DATA BACKUP SERVICE REQUESTS FROM USER

FIG. 14


SERVICE SELECTION CONTROLLER COMPONENT OF THE SSG RECEIVES SERVICE REQUEST FROM THE DEVICE CLIENT
EXTRACT DEVICE INFORMATION, SUBSCRIBER INFORMATION, LANGUAGE, SERVICE INFORMATION, SERVICE TYPE INFORMATION AND VERSION FROM THE INCOMING REQUEST
RETRIEVE SUBSCRIPTION INFORMATION FROM REPOSITORY AND SEND TO ACCESS RIGHTS MANAGER
DEVICE IDENTIFICATION SUCCESSFUL ?
NO
YES
SUBSCRIBER IDENTIFICATION AND AUTHENTICATION SUCCESSFUL ?
NO
YES
SERVICE IDENTIFICATION AND AUTHORIZATION SUCCESSFUL ?
NO
YES
SEND SERVICE DENIAL RESPONSE BACK TO THE DEVICE
SERVICE SELECTION CONTROLLER SENDS REQUEST TO BE SENT TO REQUESTED SERVICE HOSTED IN THE APPLICATION PROCESS CONTAINER THROUGH THE APPLICATION GATEWAY
SERVICE SELECTION CONTROLLER PROPAGATES SERVICE RESPONSE TO THE REQUESTING DEVICE
WAITS FOR FURTHER SERVICE REQUESTS FROM USER